



◦ 2011

Weathered

AN ANNUAL STAKEHOLDER'S REPORT PRODUCED BY
THE NATIONAL WEATHER SERVICE IN RIVERTON FOR
RESIDENTS OF WESTERN AND CENTRAL WYOMING

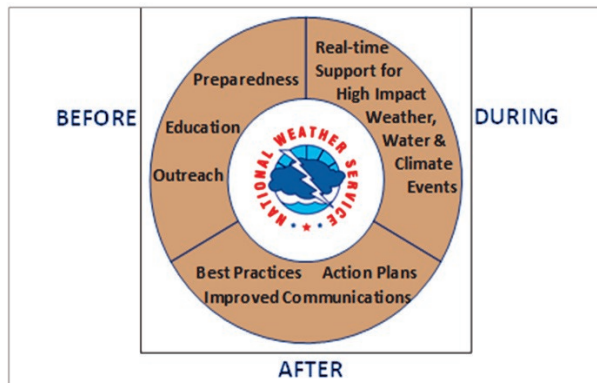
Wyoming

National Weather Service Decision Support Services

A Perspective From Meteorologist-in-Charge: Kevin Lynott

The National Weather Service (NWS) continues to move forward in providing new services and information, which enable customers and partners to make vital, up-to-the-minute decisions. Decision Support Services (DSS) is how we, as a National Weather Service, educate and ultimately save lives and property across the United States. The term "decision support" actually has a broad definition, ranging from a simple, even subconscious, action, such as advising a colleague that they should grab an umbrella before heading outside, to a customized, detailed forecast in response to an emergency situation.

National Weather Service Decision Support Services "Working together to make life-saving decisions"



I believe Decision Support Services is a three-pronged approach or process. First, there is the *preparedness* component. This includes spreading the word through outreach and education. For NWS Riverton this work primarily encompasses western and central Wyoming. Second, we are expected to *deliver accurate and timely information* during a real-time event, regardless of the severity. We essentially provide full support during high-impact weather, water, and climate events affecting western and central Wyoming. This support may be performed from the Weather Forecast Office or externally (on-site) by a NWS Riverton team member. And third, an *analysis of the event* in those impacted communities and

within the NWS completes the decision support process. By following this process, better planning and best practices are set in place for subsequent high-impact or even emergency events. *Communication* is the power that pieces all of this together, and communication must be shared and remain strong for success in the evolving and fast-paced world of NWS DSS.

NWS Riverton is committed to moving society toward a Weather-Ready Nation. The vision for the Weather-Ready Nation initiative is to help people make better decisions with better information. The emphasis on making better decisions represents a new culture for NWS, one focused on demand-driven support services. This transformation means the job is not done after products or warnings have been issued by the NWS. Overall success now depends on mitigated impacts. Improved forecast accuracy and precision will play a critical role in lessening impacts, but more can and must be done.

To learn more about the relationship between NWS Decision Support Services and building a Weather-Ready Nation, please take a look at:

http://www.noaanews.noaa.gov/stories2011/20110817_weatherready.html

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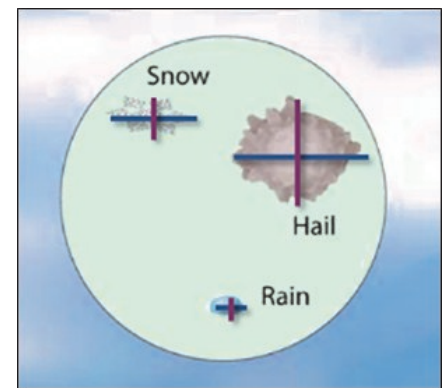
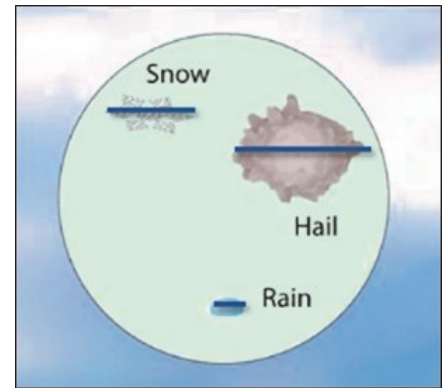
NWS Riverton Receives Major Radar Upgrade

The National Weather Service Doppler radar serving western and central Wyoming was enhanced with dual polarization technology in early November. Our office was one of the first in the country to have their Doppler radar upgraded. The deployment of this new technology will continue across the Nation through early 2013. Before this upgrade, the radar sent out a horizontal pulse which detected the relative size of objects (Figure 1). Now, the Doppler radar sends out a horizontal and vertical pulse simultaneously allowing the radar to estimate the size, shape, and variety of objects (Figure 2).

The Benefits of Dual-Pol:

- Better estimation of total precipitation
- Ability to classify precipitation type (snow, rain, hail, etc.)
- Improved ability to identify areas of heavy rainfall (flash flooding potential)
- Improved detection and mitigation of non-weather echoes
- Easier identification of the melting layer (identifying snow levels in higher terrain)
- New severe thunderstorm signatures

The full benefit of dual-pol radar, however, will not be fully realized until NWS forecasters and research meteorologists develop real-time expertise.



A Big Year for Women-Men in Science, Inc.



The NWS members of Women-Men in Science, Inc (W-MIS) are excited to share two announcements from 2011. W-MIS is pleased to announce the acquisition of its tax exempt status under section 501(c)(3) of the Internal Revenue Code, effective July 25, 2011! With this status upgrade, Women-Men in Science is now qualified to receive tax deductible bequests, devises, transfers, or gifts under section 2055, 2106 or 2522 of the Code.

What does this mean for W-MIS? The planning committee may now look forward to a more efficient way of doing business, thanks to the virtually unlimited financial opportunities which will now be available to host conferences for Wyoming youth. Our sponsors and donors will also be able to enjoy the benefits of their tax deductible contributions. Women-Men in Science looks forward to hosting conferences long into the future for our young women and men who will benefit from these educational experiences.

The second announcement is a source of pride for W-MIS. Board and committee members of W-MIS along with all members of NWS Riverton were recognized for their efforts with a Unit Citation Award, which was presented in December, 2011. A Unit Citation Award is an honorary award given by members of the NWS Corporate Board to a group of employees who make substantial efforts to further NOAA's mission. The plaque states the award is given, "In recognition of WFO Riverton staff for establishing and promoting math, science and technology programs that reach out to students interested in pursuing scientific careers." The award is hung proudly at NWS Riverton.

NWS Riverton Leads Charge in Installation of Wind Equipment near Clark, WY.

Members of the community may ask—**What is a mountain wave?** It is an atmospheric gravity wave formed when stable air (at or near mountain top) passes over a mountain barrier. Sometimes it is marked by lenticular clouds to the lee side of mountain barriers. It may be called a standing wave or lee wave.

The weather pattern that produces these mountain waves can result in significant damage to property. The National Weather Service in Riverton has been working on improving their understanding of these mountain waves with significant research over the past eight years. The terrain between Cody and Clark produces some of the most prolific downslope windstorms in the United States. The town of Clark is known to receive winds in excess of 120 mph during the winter season. A research team from the National Weather Service in Riverton travels to this area several times each winter to try and document these extreme mountain wave events. The team has measured winds as high as 110 mph but the available wind data is very sparse on a day-to-day basis. In October of 2011, after a collaborative effort between the NWS office in Riverton, the Park County Emergency Manager, and the Wyoming Department of Transportation (WYDOT), a wind sensor was installed on State Highway 120 about eight miles south of Clark, an area well known for strong winds and vehicle blow-overs. With this wind sensor, the NWS office in Riverton will be able to monitor the winds 24/7. Anyone with computer access can view the data on various websites like MesoWest (<http://mesowest.utah.edu/>).



The New Clark 8SSW Wind Sensor with the Absaroka Mountains in the Background

NEW PROGRAM: Heads-Up Alerts for NWS Riverton Spotters

During the winter of 2011-2012, NWS Riverton will begin a new pilot project through which heads-up emails will be sent to spotters who live in the lower elevations of Wyoming when a Winter Storm Watch or Warning or Blizzard Watch or Warning is issued for their area. The emails will provide a link to where they can find the latest information. NWS Riverton will utilize software that allows emails to be sent to spotters located in a specific zone or to its entire County Warning Area within Wyoming.

There are two primary goals for this project. The first goal is to increase the number of storm reports by encouraging spotters to submit reports and highlighting the various means by which reports can be submitted. The second is to give spotters a heads-up that significant hazardous weather is forecast for their area so that they can assist in spreading the word to the public. Email addresses will never be distributed outside of NWS Riverton. Trained spotters who are interested in receiving these emails, but who have not submitted an email address to NWS Riverton in the past can do so by emailing Reid Wolcott at: reid.wolcott@noaa.gov

Always Learning...



Staff at NWS Riverton are constantly trying to learn more about their forecast area. In September 2011, NWS Riverton had a special guest speaker. Dr. Jacob Lowenstern is the Scientist-in-Charge at the Yellowstone Volcano Observatory. Dr. Lowenstern spent a few hours with the staff and Emergency Managers across the area teaching them more about the Yellowstone Caldera, and what would happen if an explosion become imminent. The NWS would like to again extend its appreciation to Dr. Lowenstern for sharing his knowledge and expertise!

A Special Report: “Oh, You’re a Meteorologist—Are you on T.V.?”

Well, sometimes! Our local media partners often interview us about the wild Wyoming weather, but the majority of our time is spent at an office near the Riverton airport behind a suite of computer screens. Many people are unaware of the role of the National Weather Service and when our services are used by our media partners and by the US private weather industry, and when these entities outside of the NWS produce their own product. Hopefully the following paragraphs can help you find all of the places where our forecasts and services can be found.

Can any meteorologist issue official warnings?

It is important to note that the National Weather Service is the only *official* source of weather watches, warnings, and advisories. These official products may be freely distributed using a variety of outlets: The NWS works closely with media partners to encourage the wide publication of watch, warning, and advisory products. As a side note, the National Weather Service also provides the weather community with data from radars, weather models, satellites, and surface stations free of charge.

How do you know if the forecast you are reading is from the NWS?

There are a variety of sources from which you can obtain weather information. However, not all of the forecasts are composed by the National Weather Service. So how do you know which *forecast* comes from your local NWS office? Well, let’s explore each medium for more information:

Television and Radio

Local television stations either hire private meteorologists to compose and present their own weather forecasts, or they use weather graphics provided by private companies for the on-air personality (who may or may not be a meteorologist) to adjust at his or her discretion.

Larger cable weather companies often use a combination of the two. For example, private meteorologists hired by the cable channel present regional and local weather on the air based on their own forecasts; while watches, warnings and some observations come from the National Weather Service. Sometimes, NWS statements are played on television beyond the time that they have expired. The NWS has no control over how long their statements are broadcast on cable channels, nor do we have control over if and when the local observation in your area is included in the local forecast. If this occurs in your area, it would be best to contact your cable or satellite provider to notify them of the issue.

Some radio stations around Wyoming have hired their own meteorologist(s); while others, like NPR for example, use NWS forecasts. If our forecasts are used, the radio personality will most likely announce that it is a National Weather Service forecast.

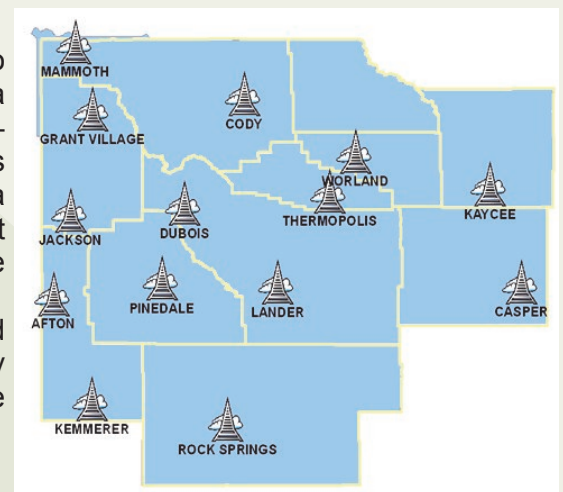
Newspapers

Most newspapers, including those in Wyoming, use a private company to produce weather graphics and forecasts for the local area.

NOAA Weather Radio

NOAA Weather Radio consists of a nationwide network of radio stations broadcasting continuous weather information directly from a nearby NWS office. Most offices have several transmitters that broadcast weather information specific to the area in which that transmitter is located. During weather related and civil emergency situations, a warning tone can be activated over NOAA Weather Radio to alert listeners of potentially hazardous situations. The Riverton NWS office operates 14 transmitters around western and central Wyoming.

Everyone who is within broadcasting range of a transmitter should have a receiver. Receivers can be purchased online or at many electronic and discount stores and are easily programmable to receive a signal. For more information, visit: www.weather.gov/nwr



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A Special Report: “Oh, You’re a Meteorologist—Are you on T.V.?” (cont.)

Mobile Sources

Many websites and apps exist to retrieve weather forecasts and information on mobile devices. Most of these apps rely on forecasts from private meteorologists. The NWS has a website where live radar and satellite imagery, current conditions, local forecasts (by zip code or city, state), watch and warning information, and more are presented in a mobile friendly format. This site can be found at: mobile.weather.gov

Online Sources

There are several places online where one can find NWS forecasts, but the only official source is: **The National Weather Service Website (www.weather.gov)**. The NWS website is easy to use and easy to remember. It is the most direct and rapid point of dissemination for all NWS products. If you would like to go directly to your *local office*, the format is: www.weather.gov/city (where “city” = your *local office*). For example: www.weather.gov/riverton will take you to the official source of NWS forecasts for western and central Wyoming. If you are not sure which office is responsible for your area, simply go to the *national* web site and click on your area; you will then be directed to your local NWS office.

Social Media

The National Weather Service has stepped into the social media realm by creating Facebook pages for each office. You can find these pages by searching for “US National Weather Service *city*” on Facebook, where *city* is your local forecast office (e.g. Riverton). These pages allow you to interact directly with NWS meteorologists, by posting reports, comments, questions, pictures, and links to video! Meanwhile, the NWS will regularly post:

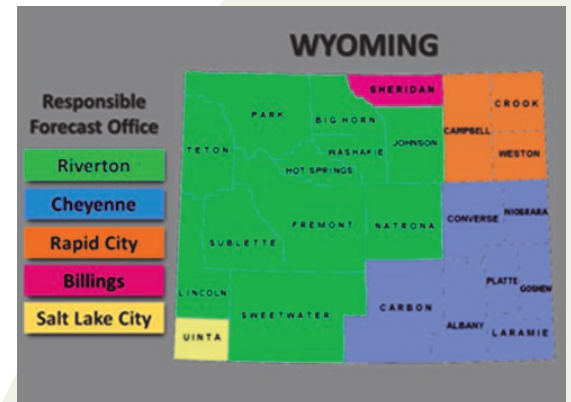
- Daily Weather Forecast Summaries
- Record Events
- Educational Weather Facts & Information
- Supplemental Forecast Graphics
- NWS & Weather News
- Training and Outreach Announcements
- ...and much more!

In Summary...

A variety of sources exist where you can obtain weather info. However, not all of the forecasts are composed by the National Weather Service...

So where can you find NWS forecasts?

- * Listen to NOAA Weather Radio
- * On the web at:
 - www.weather.gov/riverton
- * On mobile devices at:
 - mobile.weather.gov
- * Or, if you can’t find what you’re looking for and you just want to talk to a forecaster
 - Via Phone:
 - 307-857-3898** (in Riverton)
 - or
 - 1-800-211-1448** (Statewide)
 - Via email: cr.wxriw@noaa.gov
 - Via Facebook: Search for US National Weather Service Riverton and then “Like” us



There are at least two forecasters on shift 24 hours per day, 7 days per week, 52 weeks per year. We are here on Christmas morning, we are here at midnight on New Year’s Eve, we are *always* here checking out the latest model run and monitoring our network of Doppler radars. If you need to ask us about your drive to Salt Lake City on Friday, or if you need to tell us about the six inches of partly cloudy piling up on your porch, we’ll be here to take your call! If you just want to casually check the forecast for the week (and you want to be sure that the forecast is coming from one of the 15 dedicated meteorologists at your local National Weather Service office), we hope that this information has helped you find the right place.

NWS and WYDOT Partnership Continues To Expand



Flood waters from the Wind River filled an old channel of the river and eventually overtopped US Highway 26 near mileposts 104 and 105 between Riverton and Dubois on June 30. The WYDOT was one of many agencies that consistently sought information about the fluctuating river heights during the snowmelt flooding of late June and early July. NWS photo.

You probably won't be surprised to learn that in 2009 Wyoming motorists drove more miles per person than any other state – about 17,735 miles! This total was nearly two times the national average. Long drives for meetings, sporting events, shopping, and many other reasons make a daily round-trip of 300 miles seem routine in our wide open state. It stands to reason that Wyomingites frequently ask two questions when embarking across the state – “What’s the weather forecast?” and “What are the roads like?” In an effort to better address these two questions, the NWS and the Wyoming Department of Transportation (WYDOT) have established a strong relationship that has expanded over the past several years.

Employees of both agencies came together this summer to visit about weather forecasting, future developments and ideas, and providing consistent messaging to the travelling public. Through the NWS online chatroom interface, NWS meteorologists can now

stay in touch with a WYDOT meteorologist operating in that agency's Traffic Management Center (TMC) in Cheyenne. Dispatchers at the TMC receive automatic notification of significant weather events forecast by the NWS and the agencies can talk via the state radio network, WYOLink. Road closures and traffic advisories are coordinated between the agencies to ensure the public receives consistent information. For instance, the Riverton NWS now includes information in weather statements about the WYDOT advisories for no light trailer traffic when wind gusts of 50 mph are expected. WYDOT staff can also access a high-resolution forecast model provided by the NWS. This forecast model often provides a more detailed look at expected conditions, such as wind, due to the improved modeling of the topography across Wyoming.

The WYDOT aeronautics division is working with the NWS regarding data flow from new mountain pass weather stations and airport weather stations. Also, the Riverton NWS, Park County Office of Homeland Security, and District 5 of WYDOT collaborated on the installation of a new weather station in a high wind prone area along Wyoming Highway 120 between Cody and Clark. Ideas like these and other outreach opportunities to better assist and educate travellers about weather and travel conditions are already in the works for 2012.

State	Miles Per Capita
Wyoming	17,735
Mississippi	14,875
Oklahoma	13,315
New Mexico	13,243
Alabama	12,721
National Average	9,728
Source: WYDOT Transportation Facts 2010-2011	

Outdoor Education Expo 2011 at Sinks Canyon Center

Who wouldn't enjoy an opportunity to work among pastures, orchards, rock-outcroppings, and meandering waters? Staff from the Riverton, WY National Weather Service Forecast Office once again had such an opportunity on September 30, 2011 at the 127-acre Central Wyoming College (CWC) Sinks Canyon Center. The Center hosted the second annual Outdoor Education Expo, a daylong event for fourth graders in the Lander Valley schools.

Groups of 11 students each visited ten separate learning stations set up outdoors during the expo. College students studying in the CWC Outdoor Education and Leadership degree program led the groups to the sites throughout the day. Some of the learning stations included:

- Tread Lightly and How to Wade a River
- Bird Identification
- Weather and Water
- Geology
- Trip Planning
- Wildlife Scat and Identification

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Students attending the Outdoor Education Expo, 2011.

Outdoor Education Expo 2011 at Sinks Canyon Center (cont.)

After visiting each learning station the students had their "outdoor education passport" stamped by the station leader. The 30-page passport allowed students to take home memorable learning points and helpful information from their day outdoors.

This year, Brett McDonald, science and operations officer at the NWS Riverton Weather Forecast Office, and Reid Wolcott, meteorologist intern, staffed the first portion of the "Weather and Water" station, covering topics that meet many of the education standards for fourth graders in Wyoming. They discussed the differences between weather and climate, where to find weather forecasts, how meteorologists measure the weather, and cloud identification.

Wolcott explained, "We also added a new demonstration this year, cloud-in-a-bottle, which ended up being the star of the show. It captured the interest of every kid that stopped at the station!"

Chris Jones, warning coordination meteorologist, led the organization efforts for the expo along with members of other local agencies. Wolcott said, "This event was a great opportunity to meet and create relationships with members of other local, state, and national agencies."

Agencies and organizations that participated in this event included: Central Wyoming College Sinks Canyon Center, U.S. Forest Service, U.S. Fish & Wildlife Service, Bureau of Land Management, Wyoming Game and Fish Department, Audubon Society, Wyoming State Forestry, University of Wyoming Extension, Popo Agie Conservation District, Central Wyoming College, and the National Outdoor Leadership School.



Notes from the NWS Riverton Cooperative Observer Program



Barbara and Joe Campbell of Thermopolis 25 WNW receive the Edward Stoll Award for 50 years of COOP Service!

The Riverton National Weather Service office supports 83 Cooperative Observer (COOP) sites across western and central Wyoming. The observers at each of the 12,000 COOP sites located across the United States, and many of its territories, are volunteers who collect and record daily high and low temperatures, as well as rain and snowfall amounts from NWS supplied instruments. These sites and their vital weather data are the backbone of the national climate observation network, which assists in keeping track of climate trends across the nation and the world, such as the previous droughts that have affected much of the region during the last decade.

The COOP program of the Riverton office is supported by the Cooperative Program Management team of Ralph Estell and Rich Miller with the assistance of Hydrologist Jim Fahey. This team travels across the state to keep instruments up and running, as well as completing annual site inspections, training of new

observers, and keeping up with all the paperwork at the office.

One of the newer projects that will soon become a national requirement in the near future is for as many COOP sites as possible to eventually go "paperless" through the use of the Weather Coder-3 website. This new program will allow the office, and other users of this data, to look at the data on nearly a daily basis. One advantage is the NWS and the public will not have to wait until the end of the month to see what happened at those sites!

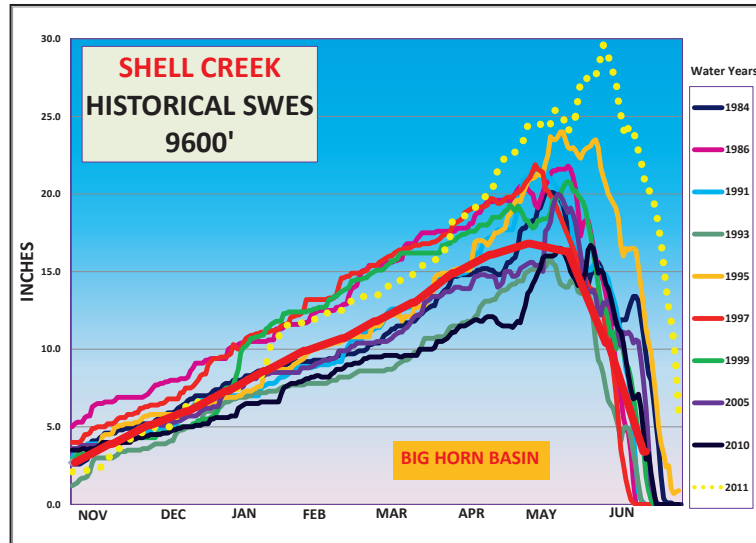
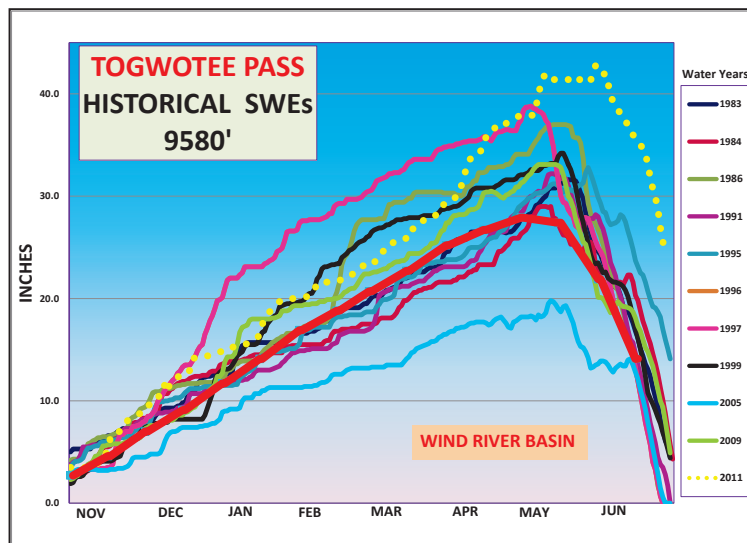
Over the course of the year we were able to present two national level length-of-service awards to well deserving, dedicated observers across the Cowboy State. The Kaufman Family of Alta received the Helmut E. Landsberg award for 60 years of COOP service, while Barbara and Joe Campbell of Thermopolis 25 WNW received the Edward Stoll award for 50 years of COOP service.

Additionally, our office was honored to present Institutional length-of-service Awards to; Moran 5WNW (USBR) - 100 years, Fontenelle Dam (USBR) - 50 years, and Kaycee (WYDOT) – 25 years. Individual Length of Service awards were also presented to Ted Heiner of Bedford for 30 years, Joe Alexander of Burris for 20 years, Karen Preis of Emblem for 15 years, Helen Straight of Buffalo for 10 years, Nada and Mervin Larsen of Sunshine for 10 years, and Chris Hall and Les Tanner of Buckboard Marina for 10 years of service.

Hydrology Corner: A Report from the Service Hydrologist

A Summary of the 2010-11 Water Year

Water Year 2011 (WY2011) was an exceptional water year as watersheds across Wyoming saw **well above** normal spring and early summer runoff. The water content of the mountain snowpack along several of the major basins across Wyoming was at record levels by late winter and early spring. A cool spring allowed the historical spring runoff to last into the middle of July.



The record spring and early summer runoff caused several high water problems:

1. **Salt River and tributaries**—Rain on a melting near record snowpack caused flooding along the Salt River and along many tributary streams and creeks in Star Valley. The flooding began in the middle of May and lasted through the middle of June. Peak flows occurred around Memorial Day.
2. **Wind River**—Excess runoff due to above normal temperatures in late June and early July caused record flooding along the Wind River. Highway 26 was closed for two weeks due to flooding. The Wind River at Riverton peaked at 11.83' on July 3rd which broke the all-time stage record (records began in 1906).
3. **Shell Creek**—Above normal temperatures in late June caused excess runoff along Shell Creek. Moderate to major flooding occurred from below Shell to north of Greybull. Shell Creek rose to a record setting 4,800 cubic feet per second (cfs) on June 30, which broke the previous record of 3,000 cfs set in 1945 (records began in 1941).
4. **North Platte River**—Above normal temperatures across the North Platte Watershed in early June caused the North Platte River to swell to record levels beginning in early June. Widespread flooding occurred in the North Platte River Valley upstream of the major reservoirs. The reservoirs contained the high water and helped limit high flows downstream.



*Salt River near Etna
May 26, 2011*



*Wind River near Morton—
Highway 26
June 30, 2011*



*Shell Creek—Kedesh
Guest Ranch Bridge
near Shell
June 30, 2011*



*North Platte River near
Saratoga
June 20, 2011*

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Hydrology Corner: A Report from the Service Hydrologist (cont.)

Major Gaging Installations During WY2011

Strong partnerships with other federal, state, and local agencies continued through WY2011. A number of new projects and/or gage installations were completed.

1. **Laramie River Gage**—This site was completed in late April 2011 by the Service Hydrologist with the help of the University of Wyoming and the City of Laramie. This station logs 15-minute river stage data and is transmitted every hour via GOES. This site is on the NWS Cheyenne AHPS page. This site's hydrology data will greatly help in monitoring high flows along the Laramie River that directly affects the City of Laramie. Also, the real-time river data will be used extensively by NOAA, Albany County emergency management, and the Wyoming state climatologist's office in monitoring the spring runoff along the Laramie River.
2. **Little Goose and Big Goose River Gage and Rain Gage Network**—The Service Hydrologist with the assistance of States West Water Corp. and the City of Sheridan installed three river gages and five rain gages from September 2010 to July 2011. The three river gages were operational by May 5, 2011. These gages will be used to better track and forecast future high flows along the Little and Big Goose Creeks during rain on snowmelt high runoff events as well as flash flood events that will affect the town of Big Horn and the city of Sheridan.
3. **River and Rain gage installation along Powder River**—Partnering with the Powder River Conservation District, the Service Hydrologist was able to install a river and rain gage along the Middle Fork of the Powder River near Bar C Ranch. The gages will be used to better forecast future rain on snowmelt high runoff events that will affect the town of Kaycee.
4. **River Gage installation along Middle Fork Popo Agie River near Mortimore Lane Bridge**—The Service Hydrologist, the Popo Agie Conservation District, and the City of Lander installed a river gage along the Middle Fork Popo Agie River. This gage replaced the previous gage that was damaged during the June 2010 flood. The gage will be used to better track high flows that will affect the City of Lander.
5. **Rain gage and air temperature sensor installation along the Medicine Bow River**—Partnering with the USGS, the Service Hydrologist was able to install a rain gage and temperature sensor along a brand new river gaging station along the Medicine Bow River. The gages will be used to better forecast the timing of rainfall on snowmelt runoff events—in order to better forecast the onset of future high runoffs that will affect the towns of Elk Mountain and Medicine Bow.



Other Gaging Installations during WY2011:

- Staff gage installation at Encampment River at Encampment
- Staff gage installation at Little Popo Agie River at Hudson
- Temperature sensor and rain gage installation near Clark
- Temperature sensor installation at USGS river gage along Dinwoody Creek
- Temperature sensor installation at USGS river gage along Wind River near Dubois
- Temperature sensor and rain gage installation at USGS river gage along Henrys Fork near Manila

Hydrology Projects for WY2012:

- *Enhancements to short term river forecasting across Wyoming*—24 hour to 5 day forecasts—using new gages formed with partnerships with other federal, state, and local governments across Wyoming
- *Enhancements to Quality, Clarity, and Timeliness of Graphical Long-term Hydrological Products to Customers*—Products include: Drought Outlooks, Flood Potential Outlooks, and Water Supply Outlooks
- *Popo Agie River Gaging Project*
- *Middle Fork Powder River Gaging Project*
- *Install River Gage at the Town of Baggs*—To better monitor high flows along the Little Snake River that directly affects the Town of Baggs
- *Install an automated weather station in Sinks Canyon*—Station would include precipitation, wind, and relative humidity information
- *Miscellaneous Rain Gage/Air Temperature Sensor Installations*—Install rain gages on state/USGS/USBR-owned gages along East Fork Smith's Fork Watershed, Nowood River Watershed, Salt River Watershed, and the Upper and Lower North Platte River Basins

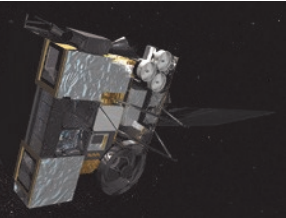
On-Site Exercises Help to Enhance Decision Support Services at NWS Riverton

NWS Riverton conducted two exercises in May and October of this year designed to help provide better Decision Support Services (DSS) to NWS customers. Examples of DSS are communicating weather information effectively to decision makers such as emergency management and the Wyoming Department of Transportation. Other examples of DSS include more specific services such as fire weather and avalanche forecasts. By improving DSS, we also improve our ability to communicate weather advisories, watches, and warnings as well as forecast information to the public via our webpage, Facebook, and even NOAA All-Hazards Weather Radio. Another part of providing good DSS is keeping up communication with our partners that can assist us out during weather events. We can provide advance notice to local emergency management agencies and media outlets to ensure people are prepared for high impact weather events and we can receive critical weather information from them during these events. These exercises have helped us as an office to be better prepared for future weather events by increasing our awareness and ability to communicate weather information effectively. We plan to conduct more of these exercises in the future in an ongoing effort to continually increase our level of service to the customer through 2012 and beyond.



NWS Staff Participate in a DSS Exercise in October, 2011

NOAA Activates GOES-15 Satellite; Deactivates GOES-11 After Nearly 12 Years of Orbit



Artist's Concept of GOES-15 in orbit

(Source: NOAA) For 12 years, GOES-11, one of NOAA's geostationary satellites, tracked weather and severe storms that impacted the U.S. West Coast, Hawaii, and the Pacific region. In December 2011, NOAA completed the process to deactivate the satellite, which is approaching the end of its useful life, and replace it with a new, more advanced spacecraft.

The new geostationary satellite, GOES-15, has taken the place of GOES-11 and now becomes NOAA's GOES-West spacecraft in a fixed orbit over the Pacific Ocean, midway between Hawaii and the West Coast and 22,300 miles above the equator. GOES-15 provides more data, with better resolution and image stability than GOES-11.

GOES-15 joins NOAA's other operational geostationary satellite, GOES-13, which serves as the GOES East spacecraft. The GOES are not only used for weather applications, but also track space weather, oceanographic changes, forest fires, and other hazards and provide scientific data collection and information for search and rescue operations.

Aware that GOES-11 was nearing the end of its fuel supply, NOAA personnel spent the last several months of 2011 planning for the end of its mission. Deactivation of GOES-11 began in December when data observations were shifted to GOES-15. On December 15, NOAA fired the spacecraft's booster, moving GOES-11 approximately 185 miles (300 km) above its current geostationary orbit, where it will be officially decommissioned.

"With its steady eye on dangerous weather conditions, GOES-11 served America well, providing the critical images and atmospheric measurements NOAA meteorologists needed to produce life-saving forecasts," said Mary Kicza, assistant administrator for NOAA's Satellite and Information Service.

Launched May 3, 2000, GOES-11 was originally planned for a five-year mission, but lasted nearly seven years longer. "GOES-11's extended service is testimony to the great work of Space Systems/Loral, NASA and the team of NOAA staff and contractors who acquired and managed the spacecraft," Kicza added.

In addition to GOES-15 and GOES-13, NOAA has two other geostationary satellites in orbit – GOES-12, which provides data for South America, and GOES-14, which is in a storage orbit as a ready backup or replacement.

NOAA is planning the next generation of geostationary satellites, called GOES-R, with the first set to launch in 2015. GOES-R is expected to more than double the clarity of today's GOES imagery and provide more atmospheric observations than current capabilities with more frequent images. In addition, data from GOES-R instruments will be used to create many different products NOAA meteorologists and others will use to monitor the atmosphere, land, ocean and the sun.

New Product in 2011: Grand Teton National Park Recreation Forecast



On May 31st, 2011 the National Weather Service in Riverton began issuing daily recreation forecasts for Grand Teton National Park. Staff from NWS Riverton collaborated with Rangers from Grand Teton National Park to create and design this product to help visitors stay safe and enjoy their visit, as well as help park staff provide a great visitor experience. The idea was brought from NWS Seattle where they create a similar forecast for Mount Rainier National Park. Through the summer of 2011 positive feedback has been received from both park staff and visitors who have utilized the product.

The product is broken into four sections. The first contains a short synopsis of the weather for the next one to three days. The second section is a lightning threat forecast which gives a threat level for “today”, “tonight”, and “tomorrow” and is meant to give hikers and visitors early warning of the potential for thunderstorms and remind them of the dangers of lightning. The third section details the sky forecast, in plain English, for the next 24 hours based on the Terminal Aerodrome Forecast (TAF) for the Jackson Hole Airport. It is especially useful for photographers to determine the amount and height of clouds and if the mountains will be visible at a given time of day. The last section gives a three-day forecast for select locations around the park. Locations include the three primary visitor centers (Moose, Jenny Lake, and Colter Bay) as well as four backcountry and hiking locations.

The recreation forecast is usually issued around 3:30 AM daily from May through September and is available through the drop-down list on the NWS Riverton homepage.

RECRIM

GRAND TETON NATIONAL PARK RECREATIONAL FORECAST
NATIONAL WEATHER SERVICE RIVERTON, WY
500 AM MDT MON JUL 10 2011

SYNOPSIS: ...WARM AND MOIST SOUTHERLY FLOW WILL BRING SCATTERED THUNDERSTORMS TO NORTHWEST WYOMING TODAY. HIGHER LOW CLOUDS WILL GIVE WAY TO MOSTLY SUNNY SKIES THIS AFTERNOON. FLOW WILL SHIFT TO WESTERLY EARLY TUESDAY AS A WEAK LOW PRESURE SYSTEM SLOWLY MOVES THROUGH THE AREA... BRIDGING WITH A CHANCE OF SHOWERS TUESDAY AND WEDNESDAY.

LIGHTNING THREAT FORECAST:
TODAY: HIGH
TODAYTON: MODERATE
TODAYTON: LOW

TODAY'S SKY FORECAST (HEIGHT ABOVE JACKSON AIRPORT):
NOTE: GRAND TETON SUMMIT IS 7800 FT ABOVE THE AIRPORT.
PERMANENTLY CLEAR...SCATTERED-WASSTY CLOUDY...BROKEN-WASSTY CLOUDY
12 AM TO 04 AM: SCATTERED AT 1800 FT. BROKEN AT 4000 FT.
04 AM TO 08 AM: FCM AT 4000 FT.
10 AM TO 04 PM: SCATTERED AT 7000 FT.
12 PM TO 12 AM: SCATTERED AT 4000 FT. BROKEN AT 10000 FT.

FORECASTS FOR SELECT LOCATIONS:

	MON	TUE	WED
MOOSE	61/ 60	69/ 69	71/ 71
4400 FT	8 31 SW 120 W 41 SW 61 SW 61	WIND (DPR)	WIND (DPR)
	30% 30%	70% 30%	30% 30%
JENNY LAKE	60/ 49	67/ 47	69/ 49
4200 FT	8 12 SW 120 W 51 SW 61 SW 61	WIND (DPR)	WIND (DPR)
	30% 30%	70% 30%	30% 30%
COLTER BAY	79/ 61	66/ 46	69/ 49
4800 FT	8 12 SW 120 W 51 SW 61 SW 61	WIND (DPR)	WIND (DPR)
	30% 30%	70% 30%	30% 30%
BERRY CREEK PT	64/ 60	71/ 60	71/ 60
7600 FT	8 31 SW 120 CALM CALM SW 61	WIND (DPR)	WIND (DPR)
	30% 30%	70% 30%	30% 30%
DEATH CANYON PC	47/ 59	42/ 58	42/ 58
7800 FT	8 30 SW 120 W 24 SW 18 SW 18	WIND (DPR)	WIND (DPR)
	30% 30%	70% 30%	30% 30%
LOWER JACCLE	48/ 22	59/ 24	59/ 39
11400 FT	8 38 SW 180 W 24 SW 22 SW 18	WIND (DPR)	WIND (DPR)
	30% 30%	70% 30%	30% 30%
GRAND TETON	50/ 19	24/ 19	24/ 19
13770 FT	8 38 SW 180 W 24 SW 22 SW 18	WIND (DPR)	WIND (DPR)
	30% 30%	70% 30%	30% 30%

THIS PRODUCT IS ISSUED AROUND 3 AM DAILY FOR THE MOST UP-TO-DATE INFORMATION CALL 1-800-887-8899 OR VISIT WWW.NEWSERVICE.RIVERTON

Forecast Summary
For Northwest Wyoming

Lightning Threat Forecast
For Grand Teton National Park

Sky/Cloud Forecast
Can you see the mountains?

3-day Forecast for Select Locations
Within Grand Teton National Park

NWS Riverton Participates in Job Shadow Program

On Monday, October 24th 2011, Riverton High School Senior, Geri Hagar, shadowed NWS Riverton's Information Technology Officer (ITO), Nancy Eustice. Nancy showed Geri what a typical day is like as an ITO in the National Weather Service. Job shadowing enhances career development and exploratory learning for the one who is shadowing. Geri experienced unique hands-on learning and training in a real world environment. Geri was able to experience a morning weather briefing, given by forecaster Katy Branham. Riverton WFO's Science and Operations Officer, Brett McDonald took Geri through many aspects of the aviation forecast desk. It was a very informative day.



Automated Surface Observing (ASOS) Laser Beam Ceilometer (LBC) Upgrade

The Automated Surface Observing System ASOS has completed a nationwide upgrade to improve the quality of weather data as it pertains to accurate measurement of cloud height. Although the old cloud height indicator, (ceilometer) was accurate, it was limited in altitude and quantity of measurable cloud layers. The new upgraded indicator increased the measurable altitude and increased the number of measurable cloud layers. This upgrade provides greater usability to the pilots and the aviation community.



The LBC CT12K sensor

The old LBC CT12K made by Vaisala went into service in the early 90's as a stand-alone sensor, and was incorporated into the ASOS during 1998. The CT12K uses a 40 watt laser operating at 900nm wave length to bounce a pulse of light off the overhead cloud to measure the height of the cloud. The CT12K measured a maximum height of 12,000 feet above sensor height with a 50-foot-resolution and processed the height for the two cloud layers with the strongest return signal.

The new LBC CL31 made by Vaisala went into production in 2007 and was incorporated into the ASOS during 2011. The CL31 uses a similar laser and similar process to measure the height of overhead clouds. The CL31 measures a maximum cloud height of 25,000 feet above the sensor height with a 10-foot-resolution and processes the height for the three cloud layers with the strongest return signal. The new ceilometer was installed at several airports around western Wyoming.

Operations

The aviation and flying community operates under flying conditions determined by the airfield meteorological conditions. Cloud height below 3,000 feet is the most significant parameter used to determine the current flying condition. If the cloud height is greater than 3,000 feet above the airfield the conditions are set to Visual Flight Rules, VFR. Cloud heights less than 3,000 feet above the airfield result in a varying degrees of instrument flight rules or the airfield may be closed. Accurately measuring the cloud height impacts airfield operations and flight safety. This upgrade to the ASOS has improved accuracy and affected airfield safety. Providing data with greater resolution, higher maximum detection and increased number of cloud layer processing provides a clearer meteorological picture of the condition at and around the airfield.



The LBC CL31 sensor

Director of NWS Central Region Visits NWS Riverton



A special visitor came to NWS Riverton. Lynn Maximuk, Director of the NWS's Central Region, came to visit NWS Riverton in August 2011. Mr. Maximuk arrived in the afternoon with enough time to attend one of NWS Riverton's staff meetings, which are held every couple of months.

During his visit, Mr. Maximuk described his vision for the future of the National Weather Service. He made sure to include a lot of discussion about the Weather-Ready Nation initiative, and what it means for our agency.

After attending the staff meeting, Mr. Maximuk went on a tour of the NWS Riverton facility, and later met with members of NWS Riverton for a casual dinner.

Bringing Home-Grown Weather Forecasts to the Farm and Ranch Communities



NWS Riverton meteorologist Chris Jones (left) and NWS Cheyenne meteorologist Chad Hahn passed along important information to attendees at the Wyoming Stock Growers Association Trade Show in Laramie this past June. Photo courtesy of Brenda Ling, NRCS.

Each year the NWS Riverton office seeks to enhance outreach and education to at least one major customer group. From schools to pilots to boaters, we have focused on how to reach specific customers and partners to help them understand our services and to provide basic weather education.

In 2011, the NWS Riverton office sought to expand outreach within the farm and ranch community. The year kicked-off in February when we were invited to be the keynote address at the Fremont County Farm and Ranch Days luncheon. As part of this presentation, NWS Riverton staff created a brochure providing information about services including specific web links that could assist farmers and ranchers in making informed decisions about their operations. The Riverton and Cheyenne offices teamed up in June to host a booth at the Wyoming Stock Growers Association (WSGA) annual tradeshow in Laramie. Over 200 people visited the booth to discuss not only NWS services but the various means by which they could communicate with their servicing NWS office. Many of the visitors volunteered to be contacted by the NWS when hazardous weather was in their area. A second detailed brochure was also provided to attendees

at the WSGA's Winter Roundup in December.

Forecaster Dan Berc of the Riverton NWS led efforts to get articles about NWS services published in various magazines distributed to many rural households across the state. Dan's articles were published in both the University of Wyoming Extension's "Barnyards and Backyards" and the WSGA's "CowCountry." Meanwhile, another article appeared in the Wyoming Rural Electric News regarding the art of meteorology and the services provided by Wyoming NWS offices. Hopefully you were one of the loyal readers who perused one of these articles.

The partnerships and friendships forged over the past year will assist the Riverton NWS office as we move forward into an era of high-impact decision support services. It will also allow the NWS to better seek input and ideas from the very important agricultural community.

Changes Coming to the Aviation Program

The way forecasters at NWS Riverton write their aviation forecasts will be changing in early 2012. Airport forecasts, called Terminal Aerodrome Forecasts (TAFs) are a crucial part of flight planning for pilots. They contain information on expected ceiling heights, visibility, weather, and wind for a five statute mile area surrounding airports. NWS Riverton completes these 24 hour forecasts four times a day at nine airports.

The elements and frequency of TAFs will remain the same. The difference comes in our purpose for writing these forecasts. Currently, TAFs are written only with concern for flight categories [Visual Flight Rules (VFR), Marginal VFR, Instrument Flight Rules (IFR), and Low IFR)], with almost no regard for individual airport operations. In March 2012, this will change. The NWS is adopting a new kind of TAF writing called Categorical Amendment Criteria (CAC). CAC forecasts include parameters for Airfield Minimums and Alternate Minimums in addition to IFR, MVFR, and special concerns. Also, where they used to be separate verification elements, visibility and ceiling will be treated as one element. This will mean different methodologies for NWS forecasters, but will make TAFs much more useful for area pilots and airports.

A regional webinar regarding this change is expected to be held in early 2012. For more details, please contact Katy Branham, Aviation Program Leader, at Katy.Branham@noaa.gov.





NWS Riverton Expands into Social Media Through Facebook

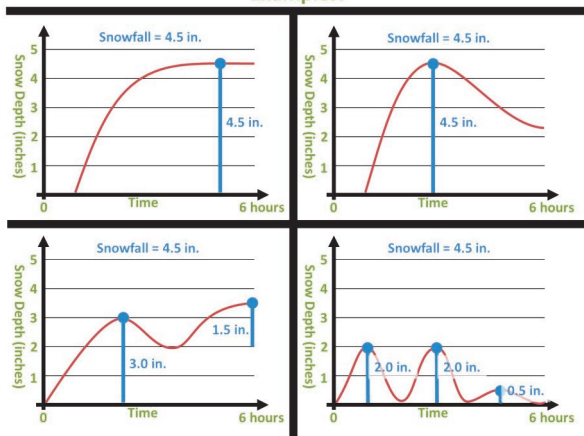
On April 30th, 2011 NWS Riverton made its first appearance on Facebook in order to expand its use of social media and streamline Weather Forecast Office operations. Since then the "US National Weather Service Riverton Wyoming" Facebook page, led by the enthusiastic members of the Social Media Team, has become one of the most successful NWS Facebook pages in Central Region with over 900 people "liking" the page as of December. In fact, based on 2000 Census data, the NWS Riverton Facebook page ranks first in number of fans by population density and number four in fans per capita.

Facebook has allowed our office to use social media to reach out and interact with the public in a way that wasn't possible before. Facebook gives our 'fans' the capability to 'write on our wall' (provide their own postings) and comment on our posts on the page. Comments and posts can range from weather spotter reports, pictures, videos to detailed weather questions. For example, on June 8, 2011, a spotter report came in via Facebook of one inch diameter hail in Natrona County, providing verification for a Severe Thunderstorm Warning through social media for the first time in NWS Riverton history.

How do you accurately measure and report snowfall?

- Snowfall is measured to the nearest 0.1 inch
- If snow continually melts as it lands, it is reported as a Trace
- If snow is melting, frequent observations may be required to obtain an accurate snowfall report
- If snow is drifting, take a few measurements and find the average

Examples:



venue through which we can provide text-only messages, images/graphics, and links for our 'fans' to be better informed of the various weather events that develop throughout our County Warning Area in Wyoming. Furthermore, Facebook has allowed us to maintain awareness of current weather conditions by allowing the public to post current weather conditions to our wall, especially when hazardous weather impacts the region.

Facebook users can find our page by searching for "US National Weather Service Riverton" on Facebook or at:

<http://www.facebook.com/US.NationalWeatherService.Riverton.gov>



BY THE NUMBERS



Protecting lives and property is part of the mission statement for the National Weather Service. To protect our customers, the forecasters at NWS Riverton issue severe weather related statements throughout the year. During 2011, this included:

- **49** Red Flag Warnings (Fire Weather)
- **46** Winter Weather Advisories
- **16** Winter Storm Warnings
- **48** Severe Thunderstorm Warnings
- **6** Tornado Warnings and
- **11** Flash Flood Warnings
- **28** High Wind Warnings



NWS Riverton, WY

12744 West US Hwy 26
Riverton, WY 82501
(800) 211-1448
weather.gov/riverton